Amendment to the Specification

In the Specification:

Please amend the specification as follows:

On Page 6, the paragraph beginning at line 27 should be replaced with the following.

Preferably the physiological training and evaluation simulator includes an indicator coupled to the evaluation circuit, such that in response to the signal the ~~indictor~~ indicator provides an indication relating to the performance of the simulated procedure. The indicator can be implemented as a light source, a meter, or an audio source.

On Page 11, the paragraph beginning at line 26 should be replaced with the following.

FIGURE 14A schematically illustrates [[an]] a conductive elastomer-based circuit corresponding to the circuit diagram of FIGURE 10C;

On Page 11, the paragraph beginning at line 28 should be replaced with the following.

FIGURE 14B schematically illustrates [[an]] a conductive elastomer-based test circuit fabricated to provide a working model of the present invention, corresponding to the circuit diagram of FIGURE 10D;

On Page 30, the paragraph beginning at line 16 should be replaced with the following.

Trainer 100 also enables a trainee to practice chest tube insertion. As with DPL, chest tube insertion is a procedure that is often used in trauma situations. More specifically, chest tube insertion is employed to aid patients suffering from a pneumothorax. To perform the procedure, a 2 to 3 centimeter horizontal incision is made in the fifth intercostal space, anterior to the midaxillary line on the affected side. The subcutaneous tissues are dissected to just over the top of the rib. Trainer 100 provides simulated tissue with subcutaneous tissues and ribs, and therefore support practicing this procedure. The parietal pleura, which in this embodiment is added to intercostal muscle layer 140, is punctured, and a gloved finger is inserted into the incision to avoid injury to other organs and to clear any adhesions or clots. Trainer 100 provides this opportunity as well, and the trainee user can experience the tactile interaction with simulated lungs 158 and ribs 154. The thoracostomy tube is then inserted into the pleural space. Complications encountered in chest tube

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insertion include laceration or puncture of intrathoracic ~~and or~~ and/or abdominal organs, all of which can be prevented by using the finger technique noted above, before inserting the chest tube. Thus, trainer 100 provides the opportunity for a trainee to perform and experience this aspect of the procedure as well.

On Page 46, the paragraph beginning at line 16 should be replaced with the following.

FIGURE 14A schematically illustrates an evaluation circuit 368 that includes conductive elastomers, and which is based on circuit 342a of FIGURE 10C. Circuit 368 includes conductive elastomers 374, 376, and 378. The conductive elastomers can be produced using the monomers described above in conjunction with making simulated human tissue structures, to which a conductive carbon is added. [[.]] It should be understood that the conductive elastomers can readily be formed into other shapes, such as the circular shape and concentric annular rings shown in FIGURE 13.

On Page 47, the paragraph beginning at line 3 should be replaced with the following.

A conductive probe 372 (simulating a medical instrument such as a syringe needle, which would be employed to perform a simulated medical procedure) capable of penetrating layer 379 is also coupled to battery 370. Whenever the conductive probe contacts one of conductive elastomers 374, 376, and 378, a circuit is completed and the corresponding light for the region that was contacted ~~provided~~ provides a visual indication of the completed circuit. The orientation of conductive elastomers 374, 376, and 378 is such that a relative position of probe 372 along an X-axis (extending from left to right in this Figure) of the opaque elastomeric layer 379 can be determined. For example, the region monitored by conductive elastomer 378 is designated as the correct position (along the X-axis) for carrying out a simulated medical procedure with probe 372. If the probe is placed in contact with conductive elastomer 378, the green light is energized, indicating the probe was inserted in the correct position along the X-axis. The amber is energized to indicate that the probe contacted conductive elastomer 376, adjacent to the correct position (along the X-axis). The red light is illuminated when the probe contacts conductive elastomer 374, indicating that the probe was inserted too far from the correct position (relative to the X-axis). On Page 47, the paragraph beginning at line 3 should be replaced with the following.

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On Page 54, the paragraph beginning at line 25 should be replaced with the following.

Referring once again to evaluation circuit 412 of surgical trainer 100a, the evaluation circuit is configured to evaluate a person's performance of DPL. As described above, DPL involves inserting a needle with a guide wire through the peritoneum 228 (FIGURE 2) into the abdominal cavity 120 (FIGURE 5). Once the needle has penetrated the peritoneum 228, the needle is further inserted a short distance and is then removed, leaving the guide wire. A small incision is then made and the peritoneal lavage catheter is inserted over the guide wire and into the peritoneal cavity. The guide wire is then removed from abdominal cavity 120 so that only the lavage catheter remains. Evaluation circuit 412 therefore preferably includes a plurality of individual conductive elastomer-based circuits disposed throughout the simulated operative area. Preferably at least one such circuit will be disposed proximate an upper layer of simulated abdomen tissue 112 to evaluate if the trainee has selected to insert the needle in the correct portion of the abdomen. At least one other circuit will be disposed proximate peritoneum 228, to determine if the trainee has inserted the needle to the proper depth. Such "stacked" evaluation circuits are represented by circuits 394, 396, 398, 400, 402, and 400 of FIGURE 15. The more of such circuits that are employed, the greater will be the detailed [[the]] evaluation of the performance of this medical procedure. For example, if only circuits 394 and 404 were utilized, the evaluation would only be able to determine if the needle had penetrated the layers proximate circuits 394 and 404, which are relatively far apart. It would be desirable to provide feedback to a trainee such as an indication that the needle has been inserted past layer 224 (the anterior rectus sheath), muscle layer 212, and the posterior rectus sheath 226 (see FIGURE 15), but not as far as peritoneum 228. Such feedback will provide useful information to the trainee with respect to how far the needle should be inserted.

On Page 55, the paragraph beginning at line 29 should be replaced with the following.

Surgical trainer 100a of FIGURE 16 includes a chest surgical practice area with chest tissue structure 114, which can be used to simulate chest tube insertion procedure and pericardiocentesis. Chest tube insertion requires making a 2-3 centimeter horizontal incision in the fifth intercostal space, anterior to the midaxillary line on the affected side. Preferably, each side of surgical trainer 100a will include an evaluation circuit 414, specifically configured to evaluate chest tube insertion, to

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determine if a person being trained or evaluated has performed the procedure correctly. Evaluation circuit 414 will include a portion disposed proximate a skin layer, to determine if the trainee has made the incision in the proper location. The chest tube insertion procedure also requires the insertion of a thoracostomy tube into the pleural space. Evaluation circuit 414 can include additional evaluation circuits using conductive elastomers disposed within surgical trainer 100a to determine of the tube has been inserted properly. Complications encountered in chest tube insertion include laceration or puncture of intrathoracic ~~and or~~ and/or abdominal organs, and as described above with respect to organ 406 simulating an intestine, evaluation circuit 414 can include evaluation circuits in each adjacent simulated organ to evaluate if the simulated chest tube insertion has damaged any adjacent simulated organs.

On Page 64, the paragraph beginning at line 1 should be replaced with the following.

FIGURE 19B is a flowchart 451 showing the steps employed to construct a conductive elastomer-based evaluation circuit using a conductive fabric. In a block 453, a conductive fabric is provided. Generally, wire cloth is less desirable than synthetic fiber-based conductive fabric because the synthetic fiber is more likely to enable a realistic simulated physiological structure to be achieved (wire mesh does not simulate any anatomical structure, whereas synthetic fiber can more readily simulate a fibrous tissue layer). However, wire cloth enables a functional circuit to be achieved. In a block 455, the circuit configuration is determined (this step is analogous to the step of block 454 in FIGURE 19A). Again, the configuration of the evaluation circuit is highly dependent on the simulated physiological structure in which the circuit will be used, and the simulated medical procedure to be evaluated.

On Page 77, the paragraph beginning at line 21 should be replaced with the following.

In a simple form, conductive elastomeric ~~evaluations~~ evaluation circuits in accord with the present invention are configured to provide feedback when a simulated procedure completes or breaks the evaluation circuit. In such implementations the metric is simply whether a current is flowing through the circuit. As noted above, other implementations will employ more complex circuits. Those of ordinary skill in the art will recognize that such circuits can be configured to provide more sophisticated types of feedback. Such uses include, but are not limited to, determining

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a three-dimensional position of a simulated medical instrument (such as a needle, a catheter, an endoscope, or other tool) during each phase of a simulated procedure, measuring pressure (useful for determining if the force applied by a trainee in ~~handing~~ handling a structure such as an organ is appropriate), measuring impedance changes throughout a circuit, identifying which portion of a simulated physiological structure has been incised, and/or responding to changes in pressure. The use of appropriate sensors in a conductive elastomer-based evaluation circuit will enable changes in physical properties of the model to be evaluated. For example, some medical procedures involve the application of heat, cold, electromagnetic radiation and or chemicals (i.e. drugs) to tissue or other physiological structures. Appropriate sensors can be incorporated into conductive elastomeric-based evaluation circuits so that feedback relating to the physical property change can be gathered. For example, quantitative chemical sensors can be included that will determine if a required dosage of a physiologically active drug has been administered, such that the correct physiological response is simulated by the model (i.e. a change in simulated respiratory rates, a change in a simulated heartbeat, etc.). The conductive elastomer-based evaluation circuit (or network) can be used for bidirectional communication with a controller or processor (i.e. data from the network/circuit to the processor, and commands from the processor to the network/circuit).

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